

Unit 7

DAY 4

TIME, RATE, DISTANCE, WORK PROBLEMS

DISTANCE PROBLEMS

Ex1:

George jogged downhill at 6 mph and then jogged back up at 4mph. If the total jogging time was $1\frac{1}{4}$ hr, how far did he jog in all?

$r \cdot t = d$

$t = \frac{d}{r}$

$r = \frac{d}{t}$

	rate (mph)	time (hours)	distance (miles)
downhill	6	$\frac{x}{6}$	x
uphill	4	$\frac{x}{4}$	x

let x = dist. going uphill (miles)

$$\text{time running up} + \text{time running down} = \text{Total time}$$

$$\frac{x}{4} + \frac{x}{6} = 1\frac{1}{4}$$

$$\left(\frac{x}{4} + \frac{x}{6} = \frac{5}{4}\right) \cdot 12$$

$$3x + 2x = 15$$

$$5x = 15$$

$$x = 3$$

George ran a total of 6 miles

Ex2: Two buses leave Houston at the same time and travel in opposite directions. One bus averages 55 mph and the other bus averages 45 mph. How long will it take them to be 400 miles apart?

	rate (mph)	time (hours)	distance (miles)
Bus 1	55	t	$55t$
Bus 2	45	t	45

Let t = time elapsed when buses are 400 miles apart.

Bus 1's dist. + Bus 2 dist. = Total

$$55t + 45t = 400$$

$$100t = 400$$

$$t = 4$$

Work problems

Ex3: Diana can mow the lawn in 20 minutes. Joan can mow the lawn in 30 minutes. If they work together, how long will it take them to mow the lawn?

	Rate (part/min)	Time (minutes)	Part of Job done
D	$\frac{1}{20}$	t	$\frac{t}{20}$
J	$\frac{1}{30}$	t	$\frac{t}{30}$

let $t =$ ^(min) time working on job together

D's part + J's part = whole lawn

$$\left(\frac{t}{20} + \frac{t}{30} = 1 \right)^{60}$$

$$3t + 2t = 60$$

$$5t = 60$$

$$t = 12$$

Together they would take 12 mins

Ex4: An experienced carpenter can panel a room 3 times faster than an apprentice can. Working together, they can panel the room in 6 hours. How long would it take each one working alone to do the job?

	rate part/hr	time (hours)	part of Job accomplished
Fast	$\frac{1}{x}$	6	$\frac{\cancel{6}}{x}$
Slow	$\frac{1}{3x}$	6	$\frac{\cancel{6}}{3x} = \frac{2}{x}$

$\frac{6}{x} + \frac{2}{x} = 1$

let x = # of hours it takes fast carp to do job.

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